

**We Claim:**

1. A process for delivering a polynucleotide to an extravascular parenchymal cell in a tissue of a mammal *in vivo*, comprising:
  - a) inserting a viral vector in a solution into the lumen of a vessel in the mammal;
  - b) increasing vessel permeability within the tissue; and,
  - c) delivering the viral vector to the tissue outside the vessel thereby delivering the polynucleotide to the extravascular parenchymal cell.
2. The process of claim 1 wherein the viral vector is selected from the group consisting of: virus, virally encapsulated polynucleotide, and virally associated polynucleotide.
3. The process of claim 1 wherein the polynucleotide is selected from the group consisting of RNA and DNA.
4. The process of claim 2 wherein the viral vector is selected from the group consisting of: adenovirus, adeno-associated virus, retrovirus, herpes simplex virus (HSV), vaccinia virus, vesicular stomatitis virus, retrovirus, lentivirus, human immunodeficiency virus, murine leukaemia virus, syndbis virus, and recombinant virus.
5. The process of claim 1 wherein the vessel consists of a blood vessel.
6. The process of claim 5 wherein the blood vessel consists of an artery.
7. The process of claim 5 wherein the artery is selected from the list consisting of: hepatic artery, femoral artery, iliac artery, and coronary artery.
8. The process of claim 5 wherein the blood vessel consists of a vein.
9. The process of claim 8 wherein the vein is selected from the list consisting of: portal vein, hepatic vein, tail vein, coronary vein, inferior phrenic vein and saphenous vein.
10. The process of claim 1 wherein the vessel consists of a bile duct.
11. The process of claim 1 wherein the increasing vessel permeability is selected from the group consisting of: injecting a large volume, injecting the solution rapidly, increasing hydrostatic pressure against the vessel wall, increasing osmotic pressure, occluding fluid flow through vessels, and injecting a solution that contains a vasodilator.

12. The process of claim 11 wherein the hydrostatic pressure is increased by obstructing outflow from the blood vessel.
13. A process of claim 1 where the parenchymal cell is selected from the list consisting of: skeletal muscle cell, cardiac muscle cell, liver cell, prostate cell, diaphragm cell.
14. The process of claim 13 wherein the liver cell consists of a hepatocyte.
15. A process for extravasation of a viral vector in a mammal *in vivo*, comprising: inserting the viral vector in a solution into the lumen of a vessel in the mammal wherein the volume of the solution and the rate of solution injection result in increased permeability of vessels.
16. The process of claim 15 wherein the increasing vessel permeability is selected from the group consisting of: injecting a large volume, injecting the solution rapidly, increasing hydrostatic pressure against the vessel wall, increasing osmotic pressure, occluding fluid flow through vessels, and injecting a solution that contains a vasodilator.
17. The process of claim 16 wherein the hydrostatic pressure is increased by obstructing outflow from the blood vessel.